

COURSE TITLE:

Foundations of Energy

UNIT TITLE:

Energy Policies

SECTION 1: General Information and Overview

Grade Level:

9-12

Suggested Number of Lessons:

5-6

Suggested Time to Complete Unit:

1 week

Unit Overview:

Discuss present energy strategies for Kentucky and relate them to the US Energy Policy. Look at global issues economically, politically, and environmentally.

SECTION 2: Essential Questions

1.	What are the available energy sources for the generation of electricity that offers to a balance energy portfolio?
2.	How do the Kentucky Energy Strategies compare to the US Energy Policy and global energy use?
3.	Why are the Kentucky Energy Strategies important to the economy of Kentucky?

SECTION 3: Major Focus

Technical Content CTE Program of Studies	Learner Activities (Enabling Knowledge and Skills/Processes)	Core Content For Assessment	Academic Expectations
Construction Technology KOSSA Standard AD-002: Demonstrate the ability to learn new processes and steps. 2.1-- Assess the impact of various current and new technologies on the economy.	Using the provided PDF files in the <i>Policies in Kentucky unit</i> , research current and new policies in the energy industry for understandings of current energy trends and the impact on our nation's energy portfolio and economy on the state and national level.	SC-HS-4.6.1 Students will: <ul style="list-style-type: none">• explain the relationships and connections between matter, energy, living systems and the physical environment;• Give examples of conservation of matter and energy. As matter and energy flow through different organizational levels (e.g., cells, organs, organisms, communities) and between living systems and the physical environment, chemical elements are recombined in different ways. Each	2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

FOUNDATIONS OF ENERGY—ENERGY POLICIES

		recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change. DOK 3	
<p>Construction Technology KOSSA Standard AD-003: Implement new processes given oral instructions.</p> <p>2.3--Engaging in meaningful hands-on, minds-on conceptual based activities in the area of energy technologies.</p>	<p>Using the resource files on the CD, develop a presentation on the “new or emerging technologies” from research regarding energy.</p> <p>That information will be assessed in the activity, <i>Energy Source Expo</i>.</p>	<p>SC-HS-4.6.4 Students will:</p> <ul style="list-style-type: none"> describe the components and reservoirs involved in biogeochemical cycles (water, nitrogen, carbon dioxide and oxygen); Explain the movement of matter and energy in biogeochemical cycles and related phenomena. <p>The total energy of the universe is constant. Energy can change forms and/or be transferred in many ways, but it can neither be created nor destroyed. Movement of matter between reservoirs is driven by earth’s internal and external sources of energy. These movements are often accompanied by a change in physical and chemical properties of the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water as dissolved carbon dioxide and in all organisms as complex molecules that control the chemistry of life. DOK 3</p>	<p>2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.</p>
<p>Construction Technology KOSSA Standard EA-005: Display initiative.</p> <p>5.4--Students will investigate with teacher guidance the role of technology in the future.</p>	<p>Using the Backgrounder resource CD and the activity <i>Current Energy Affair</i>, explore energy around the world, implement student energy teams to develop energy management guidelines, review perspectives, laws and investigate and interpret findings.</p>	<p>SC-HS-4.67 Students will:</p> <ul style="list-style-type: none"> explain real world applications of energy using information/data; Evaluate explanations of mechanical systems using current scientific knowledge about energy. <p>The universe becomes less orderly and less organized over time. Thus, the overall effect is</p>	<p>2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.</p>

FOUNDATIONS OF ENERGY—ENERGY POLICIES

		that the energy is spread out uniformly. For example, in the operation of mechanical systems, the useful energy output is always less than the energy input; the difference appears as heat. DOK 2	
Construction Technology KOSSA Standard AC-002: Students will identify methods of planning that will save costs on time and materials.	Students identify and build an energy resource expo board for renewable and non-renewable energy sources.	SC-08-4.6.2 Students will: <ul style="list-style-type: none"> Describe or explain energy transfer and energy conservation; Evaluate alternative solutions to energy problems. Energy can be transferred in many ways, but it can neither be created nor destroyed. DOK 3 SC-HS-4.6.8 Students will: <ul style="list-style-type: none"> describe the connection between the functioning of the Earth system and its sources of energy (internal and external); predict the consequences of changes to any component of the Earth system. Earth systems have sources of energy that are internal and external to the Earth. The Sun is the major external source of energy. Two primary sources of internal energy are the decay of radioactive isotopes and the gravitational energy from Earth's original formation. DOK 3	2.6 Students understand how living and nonliving things change over time and the factors that influence the changes.

SECTION 4: Culminating Project with Scoring Guide

Students working in pairs will create and present an expo board over Kentucky Energy Strategies and how they relate to US energy policy, global energy uses, and the economy of Kentucky.

FOUNDATIONS OF ENERGY—ENERGY POLICIES

SCORING GUIDE:

CATEGORY	4	3	2	1
CONTENT	EXTENSIVE- CONTENT BEYOND WHAT IS TAUGHT IN CLASS	GOOD- EXPLANATION OF CONCEPTS COVERED IN CLASS	BASIC – WHAT HAS ALREADY BEEN COVERED IN CLASS	LIMITED- DOESN'T COVER MATERIAL AS WELL AS DONE IN CLASS
PRESENTATION	EXCELLENT- FLOWS WELL, AUDIENCE VERY ATTENTIVE- WELL REHEARSED	GOOD – FLOWS WELL PARTICIPANTS KNOW MATERIAL WELL	BASIC – FLOWS UNEVENLY MAY HAVE SOME READING OF NOTES	LIMITED- PARTICIPANTS READ FROM NOTES
INTEREST	EXTENSIVE – PARTICIPANTS MAKE MANY EXTENSIONS AND EXPLANATIONS	APPROPRIATE – ENCOURAGES QUESTIONS AND COMMENTS	BASIC – CAN FIELD SOME QUESTIONS	LIMITED – GLAD TO BE THROUGH WITH THE PRESENTATION

SECTION 5: Assessment and Enabling Skills and Processes

Assessment:	Students will plan, conduct and implement a school Energy Team and district Energy Team to perform building audits.
--------------------	---

SECTION 6: Support Materials (i.e., Resources, Technology, and Equipment)

A. Resources	NEED Secondary INFO book
B. Technology	Computer lab
C. Websites (samples of many available)	US Department of Energy, http://www.energy.gov/ Energy Information Administration, www.eia.gov Kentucky Department of Energy, http://www.energy.gov/kentucky.htm
D. Equipment	Craft supplies and 3-sided display boards